



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON D.C. 20460**

**OFFICE OF THE ADMINISTRATOR  
SCIENCE ADVISORY BOARD**

July 10, 2009

EPA-SAB-09-015

The Honorable Lisa P. Jackson  
Administrator  
U.S. Environmental Protection Agency  
1200 Pennsylvania Avenue, N.W.  
Washington, D.C. 20460

Subject: Science Advisory Board Comments on the FY 2010 Research Budget

Dear Administrator Jackson:

The Science Advisory Board (SAB) is pleased to comment on the FY 2010 EPA research budget. This is the first budget developed under your leadership, and the Board looks forward to advising you on research budgets in the coming years as the Agency enhances the science that is the foundation for EPA decision-making and the basis for understanding and preparing to address likely future environmental needs and issues.

In the face of years of budget reductions, EPA's Office of Research and Development (ORD) has done a good job of adapting its research program design to provide the most effective science it could in support of EPA's broad mission. The SAB is hopeful that the FY 2010 research budget signals an end to recent, substantial decreases in EPA's research investments. However, given the significant increase in overall EPA resources in the FY 2010 budget, it is disappointing that the core research investment increase is so modest. Budget data clearly demonstrate that even with the current small increases, the nominal and real-dollar budget for EPA research is still lower than in any year between 1999 and 2006.

The SAB has advised the EPA Administrator on EPA's strategic research directions and budgets for many years. ORD's strategic research program planning sets the direction for the research program over the long term while the annual research budget provides a snapshot of which parts of that vision will be implemented in the near term. The SAB's November 2008 advisory on EPA's strategic research directions, and our May 5, 2009 letter to you on some immediate science issues that we believe are in need of attention, are the result of these SAB-ORD interactions. The SAB is pleased that both your April 2009 response to our strategic directions advisory, and ORD's April, 2009 research briefings for the Board, show that EPA's research vision has been influenced by some of the SAB's prior advice. The SAB will continue

these strategic research interactions with ORD during our September 2009 meeting and we will provide you with our comments on that vision from time to time.

We have enclosed detailed comments on the proposed budget, including a discussion of each of the several ORD programs that we have reviewed. Here we draw your attention to three issues that we believe deserve special notice:

- The FY 2010 budget (\$158 M) for EPA's Goal 4 (Healthy Communities and Ecosystems) is slated to receive a mere 3% increase over FY 2009. Yet as the FY 2010 budget document notes, Human Health and Ecosystems (HH&E) research components "...provide the scientific foundation for the Agency's actions to protect American's public health and the environment." The total HH&E budget for FY 2010 is about 27% of the ORD total, and that is well below the approximately 50% recommended by the SAB and the NRC for EPA's core research program.
- The SAB has repeatedly noted the serious lack of Agency research activity and staff expertise in the area of behavioral social science (in contrast to the situation for economics where there is at least some sense of a coherent research program). We see little in the proposed budget that will help to rectify this problem. Effective and efficient solutions to the nation's pressing environmental problems require that EPA broaden its research vision to include improved risk communication and a consideration of the likely behavioral responses to the programs it undertakes. Social sciences research can provide an understanding of behaviors that drive environmental change and influence human exposure and health. It can also help to inform the design of policies that more effectively influence those behaviors, and that better address stakeholder (individual, community and institutional) perceptions, values, concerns, desires, intentions and actions relevant to EPA policies and regulatory programs. EPA needs to have a sufficient cadre of behavioral, social, and decision scientists to provide this understanding, to conduct relevant social science research, and to guide the Agency in forming appropriate partnerships and collaborations in this area.
- As personnel costs have increased each year and other categories of expenditures have not, the funds that are available to support extramural research, as well as those available to fund procurement of the things that are needed to conduct intramural research, diminish. Without significant overall research budget increases, the "wedging" effect of personnel costs diminishes the actual research that can be supported by EPA. This dynamic is increasingly jeopardizing the strength and balance of ORD's combined intramural and extramural research program.

On the positive side, the SAB is pleased to note the emergence of an Integrated Multidisciplinary Research (IMDR) program in ORD. Over the last decade, both the SAB and the National Academies have advised EPA to conduct integrated, multidisciplinary research that explicitly addresses the complex links among risk evaluation, people and the environment, citizen values, and risk management approaches. The SAB believes that the nascent IMDR program is a very positive response to past advice to undertake research that spans the various program components, and environmental programs, that are now a part of ORD, and much of the

operational efforts of EPA. At the same time, the modest increase in the FY 2010 budget for overall research support is not sufficient for a full beginning in the needed transformation to an integrated multidisciplinary research approach. Thus, policy decisions needed to address the more complex current and emerging threats to ecosystems and human health will continue to rely on a patchwork quilt of science that was largely conceived and developed within single-threat, single-media, and single-discipline programs. The SAB supports the IMDR effort and is available to work with ORD and others in the coming years to ensure that a comprehensive and successful program of integrated research can be implemented.

Please recognize that the advice in this letter is based upon the science program in EPA's Office of Research and Development. The SAB has long been aware that there is also considerable "research" conducted by program offices – much of it devoted to data generation, methods development, monitoring, or assessment to meet current program office needs. Our experience during the review of a wide variety of program office science assessments reveals that some ORD, and some program office activities, are of a similar type. It does not appear that specific efforts are duplicative. Nevertheless, we are concerned that the SAB's advice, being based only on the ORD program, might be missing some critical contextual information on the program offices' science activities. Thus, we believe that it is time for the SAB to take a broader view of the EPA science activity to ensure that these important contextual pieces are not missed. Our new SAB Committee on Science Integration for Decision-Making will allow us to develop a more complete picture of EPA's total science program. This, combined with the inclusion of program office science discussions in our research program reviews, will guard against the possibility that our research program advice is not fully informed by the larger contextual view of EPA science.

The SAB is pleased to have again reviewed the EPA research budget and looks forward to working with you to strengthen the Agency's vital research base. We look forward to your response to this first review and to continuing our interactions with EPA to develop future advice on the Agency's science program.

Sincerely,

*/Signed/*

Dr. Deborah L. Swackhamer  
Chair  
Science Advisory Board

Enclosure

## Enclosure

### Additional Comments on Specific EPA Research Programs

#### 1. Air and Global Change

The SAB agrees that the Agency's move toward a **multi-pollutant strategy** for evaluating and managing **air pollutants** is an important and appropriate step toward the integrated and multidisciplinary approach envisioned several years ago when ORD combined its air toxics and criteria pollutant research into a combined clean air research program. It is also consistent with our statements on "Research Integration" above. However, such a shift in direction will require additional resources. The budget does not reflect the full need for this change. The Air Program has proven to be one of the EPA's more successful, productive programs and is a reasonable choice for increased funding to move toward a "one atmosphere" approach.

The planned increase in budget for the **Global Change** research program is consistent with national and ORD priorities, and with advice given previously by the SAB. An area where this would be important is research into Life Cycle Assessment methodologies for indirect land use and greenhouse gas emissions from agriculture necessary to achieve the newly mandated Renewable Fuel Standards (RSF2) under EISA. Additional research funding is also needed to estimate the economic and environmental effects of cap-and-trade, offsets and allowances under the proposed Waxman-Markey bill [H.R. 2454, American Clean Energy and Security (ACES) Act of 2009]. It will be important for social and behavioral research to be integrated into these efforts to better inform rule-making, required by ACES or to implement the integrated science for decision making recommended by the SAB and the NRC.

#### 2. Water and Homeland Security

The planned budget allocations for **Drinking Water** and for **Water Quality** research are reasonable and are directed to important issues. An element common to both programs is the initiative begun in FY2007 on "Water Infrastructure in the 21<sup>st</sup> Century" which is slated for continuation in FY2010. This is a very important effort that is developing and demonstrating innovative approaches for renewing the nation's aging water infrastructure. There is great opportunity for leveraging EPA ORD efforts with projects being undertaken in communities across the nation, and ORD is working aggressively on such leveraging. It is a critical time for renewal of the nation's water infrastructure. The SAB recommends that the Water Infrastructure research initiative be adequately supported and expanded if possible.

While we applaud the increase of \$3M to the **green infrastructure initiative in water quality**, we strongly recommend that the investment includes integration of **social**

**sciences** to recognize the importance of the incentives households and firms face in making these types of choices and in integrating them into the analysis used to produce decision support tools that will be useful for implementation of these ideas within the regulatory structure of States and municipalities and to anticipate and address important issues in public acceptance and support of policies.

Even though EPA agrees with the need to continue to improve the scientific foundation for responding to unexpected and emerging problems and **environmental disasters**, there is a decrease of \$1.4M in their Homeland Security investment (there is no decrease in the FTE devoted to the effort). The briefing materials note that this decrease will delay the development of some decontamination and disposal techniques that would be used to respond to terrorist events.

### 3. Technology

The **Land Protection and Restoration** research program is scheduled for a minimal increase, and the total budget allotment is reasonable if directed appropriately. The expansion of research efforts on analysis of **alternative fuels** and their impacts is commendable.

An area that has seen withdrawal of nearly all EPA financial support and that should be reconsidered is **Technology Evaluation and Verification**. This program (which is included in the Sustainability program budget) has been effective in moving technology to commercialization and has involved substantial leveraging of limited EPA funds, as documented by the Environmental Technology Subcommittee of NACEPT in reports issued in 2006 and 2007. The EPA is uniquely positioned to help advance emerging technologies through performance verification because of its role as the ultimate approver for deployment of a technology. EPA financial support for specific verifications is important for program vitality. In the FY 2010 budget, FTEs are allocated to support the program but no funding is allotted to support verification projects financially. The SAB believes that it is important to maintain EPA's ability to conduct a technology evaluation and verification program to assist in bringing environmental technologies to commercialization.

The planned budget for research on environmental implications of **nanotechnology** grows slightly. Nanotechnology research is being conducted in several research program areas, including Human Health and Ecosystems, Sustainability, Clean Air, and Land Protection and Restoration, as well as some collaboration with the National Science Foundation. These efforts appear to be reasonably well coordinated. The SAB recommends continued efforts to maintain good integration of nanotechnology research across the various EPA research programs to avoid overlap and ensure the most impactful use of available resources.

#### 4. Healthy Communities and Ecosystems

Many statements from EPA note the importance of science as the backbone for Agency decision making and other activities. This research area is where much of EPA's core research to gain a better understanding of environmental and human health issues is included. It contributes materially to the science that supports decision making. After many years of cuts, there is an increase beyond inflation for some programs within the **Human Health and Ecosystem research** category. However, is very small relative to the cumulative damage done to this essential research area since 2004. The SAB notes ecosystems research has an especially dire need for increased investment because of EPA's planned shift toward a focus on ecosystems services. Without it, EPA will lack science and data required to conduct many important agency assessments (e.g., climate, water, disasters). Given the criticality of this research area, and the disproportionately large cuts over recent years, this area needs disproportionately large increases, in order to fulfill EPA's mission.

#### 5. Social Sciences, Economics, Decision Sciences, Sustainability

While the SAB was told of some examples of ORD projects involving **social sciences**, the lack of relevant research and expertise in behavioral, social and decision sciences (aside from the some aspects of economics) is evident in the FY 2010 research budget, and there seems to be no coordinated effort to increase efforts in this important area, or to integrate it with other sciences. Addressing pressing environmental problems requires an understanding of economic, demographic, and behavioral drivers of environmental changes and human exposure, as well as the values of these changes to the affected parties. The SAB and others have recommended that the Agency reflect this in its research program, and this need has been acknowledged by EPA in the past.

The Agency needs a broader vision that recognizes that social science research can provide greater understanding of the behaviors that drive environmental change and influence human exposure and health, as well as helping to design policies that more effectively influence those behaviors and that better address the values of stakeholders affected by EPA actions. Several examples of important priorities needing social sciences are: 1) consumer behavior relative to the adoption of environmentally sound practices and products, 2) automobile fuel efficiency standards, 3) benefit-cost analysis in CWA 316B permits (ecosystem services-nonuse benefits); 4) treatment and communication of uncertainty in benefit-cost analysis of global long-term environmental change; and 5) behavior change to protect the environment in areas such as conservation and recycling.

The Agency must ensure that it has a sufficient cadre of behavioral, social and decision scientists to provide scientific support for understanding and responding appropriately to individual, community/social and institutional perceptions, concerns, desires, intentions and actions relevant to EPA policies and regulatory programs. This cadre should work within the integrated multidisciplinary framework to provide relevant social science research for the Agency. In addition, it should guide the Agency in forming appropriate

partnerships and collaborations with behavioral, social and decision scientists in other agencies, and in designing extramural research and other programs to encourage the broader social sciences field to devote greater attention to issues and problems that are of direct relevance to the environmental and human health protection responsibilities of EPA.